CLAIMS

1. A liquid crystal composite (110) comprising anisometric particles (112, 113) suspended in a liquid crystalline compound (114, 134) characterised in that the particles are aligned in relation to the molecules of the liquid crystalline compound, and the orientation of the particles may be reversibly changed by the application of an electric field.

2. A liquid crystal composite according to claim 1, wherein the surfaces of the particles are treated with surfactant.

3. A liquid crystal composite according to claim 2, wherein the surfactant comprises a compound containing one or more thiol groups.

4. A liquid crystal composite according to claim 2, wherein the surfactant comprises a compound containing one or more silane groups.

5. A liquid crystal composite according to claim 1, wherein the surfaces of the particles are treated by uniaxial rubbing.

6. A liquid crystal composite according to claim 1, wherein the surfaces of the particles are treated by photo-alignment.

7. A liquid crystal composite according to any one of claims 1 to 6, wherein the thickness of the particles is in the range 5nm to 1μm, and the length of the particles is in the range 20nm to 50μm.

8. A liquid crystal composite according to any one of claims 1 to 7, wherein the surfaces of the particles reflect visible light.

9. A liquid crystal composite according to any one of claims 1 to 7, wherein the surfaces of the particles absorb visible light.

10. A liquid crystal composite according to any one of claims 1 to 9, wherein the ratio between thickness and length of the particles is at least 1:5.

11. A liquid crystal composite according to any one of claims 1 to 10, wherein the particles are 10% by weight or less of the composite.

12. A liquid crystal composite according to any one of claims 1 to 11, wherein the particles are metallic particles.

13. A liquid crystal composite according to any one of claims 1 to 12, wherein the length of the particles is less than 1μm, the particles having been synthesised from a solution.

14. A liquid crystal cell (100, 120, 130, 170) comprising:

first and second substrates (102, 104) spaced apart, at least one substrate being transparent;

first and second electrodes (106, 108) formed on the respective first and second substrates, at least one electrode being transparent;

first and second alignment layers (116, 118, 122, 132, 176, 178) formed on the respective first and second electrodes; and

the liquid crystal composite (110) according to any one of the preceding claims disposed between the two substrates.

15. A method of reversibly changing the orientation of anisometric particles (112, 113) in a liquid crystal composite (110), the method comprising the steps of:

suspending the particles in a liquid crystalline compound wherein the particles are aligned in relation to the molecules of the liquid crystalline compound; and

applying an electric field across the composite.

16. The method of claim 15, further comprising an initial step of treating the surfaces of the particles.

17. The method of claim 15 or 16, further comprising the step of bringing the suspension between two parallel substrates (102, 104) prior to the step of applying the electric field.

18 A display device comprising the liquid crystal cell (100, 120, 130, 170) according to claim 14.

19. A switchable mirror comprising the liquid crystal cell (100, 120, 130, 170) according to claim 14.

20. Means for changing the direction or shape of a beam of light from a light source comprising the liquid crystal cell (100, 120, 130, 170) according to claim 14.